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ABSTRACT

The increasing complexity of school building requirements makes it important that educators clearly understand the nature of their role in the school planning process. This review surveys 21 documents and journal articles previously announced in RIE and CIJE that discuss the educator's role as it relates to the selection and duties of the architect. Also included are descriptions of the building program -- the written means of giving the architect the kinds of information he needs to begin designing for the new facility. Not included in this review are those aspects of the educator's role that pertain more generally to management of the entire building project -- e.g., various project delivery systems from which the educator may select any one of several alternatives. One such alternative, construction management, is surveyed in a preceding review in this series (see EA 005 142). (Author)

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The Educator and the Architect

Alan M. Baas

> It is difficult to avoid the suspicion that many disappointing school buildings end up that way because the parties involved in their planning were playing the wrong roles. The most common and the most serious of these cases of mistaken identity are the educator who wants to play architect and the architect who wants to play educator. Each is in foreign territory, and neither is contributing his greatest assets to the team. . . . To remedy this confusion of roles that has plagued so many school building projects, we need a planning process that applies the best professional qualities of both educator and architect to the creation of a sound, responsive, and stimulating environment for education.
>
> *Brooks 1972*

The diversity of today's school programs and an increasing use of school facilities for community activities make it difficult to define what is expected of a new school. To alleviate this situation, many districts are using the team approach to facility planning. The planning team consists of two basic groups of people—those responsible for defining the school and community requirements, and those whose duties are to translate the educational requirements into a workable building design.

Educators on the team often include specialized educational facility planners who may be hired either as consultants or as permanent members of the district's planning unit. Other consultants who may be on the team are behavioral scientists, city planners, and lawyers. Efforts should also be made to include representatives from the educational

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community to be served by the school—teaching and nonteaching staff, pupils, and parents. The architect usually heads the technical and design component of the team, which also includes engineers and technical supportive staff.

By permitting the roles of the various team members to overlap, the team approach helps avoid excessive departmentalizing of the planning process. For instance, the architect adds his expertise to the development of a building program that adequately accommodates educational requirements, and educational consultants evaluate the consequences of various aspects of the architect's design.

The literature surveyed in this review primarily explores the nature of the educator's role as it relates to the selection and duties of the architect. In turn, since one of the educator's most important responsibilities is the written program, several documents detail the kinds of activities necessary to arrive at a satisfactory program.

Not covered in this review are those aspects of the educator's role pertaining generally to management of the entire building project—for example, various project-delivery systems. One such system, *construction management*, is surveyed in a previous review (Baas 1973).

UNDERSTANDING THE RELATIONSHIP

Pointing out that too many school buildings become educational hindrances before they are paid for, Brooks (1972) sees an urgent need for redefining the entire school planning and construction process. He observes that while much of this redefinition must occur on a districtwide scale, progress can also be made in clarifying relationships between educator and architect in the planning of a single new school. To this end, he details critical areas of architect-client interaction and explains the role the educator should assume on the planning team.

Brooks describes eight major phases generally required for the production of a new school building: long-range planning, facility programming, schematic design, design development, construction documents, bidding, construction, and occupation and evaluation. These phases must be understood as a cumulative process—that is, decisions made at one stage become input for the succeeding step. To make timely decisions and avoid delays, educators should have a basic understanding of these phases.

The multiple agencies and areas of responsibility traditionally involved in a school planning process cause additional delays. For instance, on a $5 million project, purchasing power may decrease by $100 thousand because of inflating construction costs while documents are in transit among the various approval agencies. This diffusion of responsibility also makes it difficult for the architect to maintain an efficient relationship with his "client." When several parties direct the architect, it is difficult for him to sort out instructions and arrive at satisfactory designs. To resolve such difficulties, Brooks recommends streamlining the process of document approval and appointing a specific individual to take the lead as the architect's client.

The person serving as the architect's client should

- have the authority to make routine decisions in the course of architectural planning
- listen to various users, recognize similar needs, analyze and resolve contradictions, and synthesize clear

SEQUENCE OF STAGES IN THE SCHOOL PLANNING & CONSTRUCTION PROCESS

Long-range planning: District facility needs are studied in light of demographic projections, educational methodology, and the condition of existing facilities. The result determines basic new facility needs and describes the scope of the projects that can meet those needs.

Facility programming: Problems to be solved during various design stages are defined. The facility program is the basis for the architect's schematic design effort. Emphasis should be on major concepts and basic needs rather than on minute particulars such as colors, placement of outlets, light fixtures, and so forth. Brooks warns that "information overflow in the early stages of a project obscures the big concepts and can result in a design that is little more than a collection of small, independent parts." (p. 70)

Schematic design: This phase marks the beginning of the contract architect's responsibilities and is the first of the three-phase architectural planning process. Here the owner's project requirements are interpreted by studies and drawings illustrating basic concepts and requirements. The architect also describes the major buildings systems he expects to use and evaluates the adequacy of the stipulated project budget. During the latter portion of this phase, detailed information for design development is collected (descriptions of equipment, utility requirements, finishes, and so forth).

Design development: This second phase of the architectural planning process begins on approval of the schematic design. It results in drawings and documentation plus any additional material necessary to illustrate final development and to answer all significant design questions and problems.

Construction documents: More commonly known as working drawings and specifications, this final phase of the architectural planning process transforms the approved design development package into a set of detailed, legal, bidding documents specifying the design of the school for the builder.

Bidding: The construction industry is notified that the project is ready for open public bidding; documents are released, bids received, contracts awarded, and construction ordered to begin.

Construction: The general contractor submitting the low bid begins construction of the project.

Occupation and evaluation: The final stage begins with formal acceptance of the building from the general contractor and continues to the end of the guarantee period. During the initial occupancy, it is beneficial to evaluate the performance of the building as an educational tool, which may involve assessing the program as well as the architect's design solution. Information of this type should be documented and used to improve the planning of future schools.

These descriptions are drawn from Brooks (1972) and may vary depending on the project delivery system chosen—for example, conventional general contracting, design-build (turnkeying), or construction management.

and comprehensive information for the architect

- have a real feel for the community to be served by the new school and be able to communicate effectively with community leaders and parents
- have an indepth knowledge of the overall goals of the school system, participate in the formulating of concepts to achieve those goals, and have firsthand knowledge of the operational considerations in running a school

Brooks suggests the principal of the new school might best meet these qualifications. He recommends school boards consider hiring the principal in advance and giving him leadership of the educational side of the planning team. Such planning participation would encourage the principal to see his building as a valuable educational tool.

To help explain the educator's role on the planning team, Brooks distinguishes between architectural design as a *problem-solving* process and facility programming as a predesign process of *problem definition.* Thus, the educator's most important function is defining the needs of the educational program. He should be able to provide the architect with a clear picture of basic goals and objectives, including educational policies, budgetary limitations, and any relevant information regarding the school's relation to the community. The architect must also be given factual data such as enrollment projections, curriculum details, number of periods of scheduled instruction, anticipated future growth, site and climate conditions, building codes, and relevant environmental conditions.

In a discussion of the management process as it applies to building programming, Agostini (1972) stresses that errors in long-range plans often result from a failure to understand that "physical facilities are an organic part of operations, not static shelter." Although he directs his attention to the building needs of business corporations, his treatment contains useful perspectives also applicable to educational facilities planning.

Because major facility programs may occur only once or twice during a single administration, management cannot be expected to be skilled in problem definition and development of alternative solutions within the building program. The use of special consultants can minimize the trial-and-error approach to identifying present and future building requirements. Once these requirements have been formulated, a management control document should be devised to provide information for the solution of present facility problems. Such a document also serves as a working guide for orderly expansion in the future.

Lewis (1970) discusses considerations facing architects in designing a school. He emphasizes the need for designing the building to accommodate the learning strategies proposed for the new school. Educational goals must be clearly defined through extensive communication with administrators and faculty. Ideally, the "total campus" should be a resource center serving students, staff, and community alike.

To assure that facilities meet community and educational needs and avoid costly mistakes, Silvernail (1968) stresses the need to use specialists in every phase of the construction program. The effective administrator of school construction programs must view school planning as directly related to comprehensive community planning. Silvernail gives advice on preparing a school district

master plan and using such a plan to advantage when selecting and acquiring school sites. Suggestions concern enrollment projections, educational specifications, setting up individual school planning committees, employment of architects, building specifications, and school construction finance. Finally, he presents and evaluates several typical criticisms of school construction.

Ideal relationships between the architect and university physical plant personnel are summarized in a short speech by Rounthwaite (1967). The modern university is a "many-headed animal" composed of numerous administrative personnel whose decisions must enter into the planning of any building program. Today's architect represents a complex industry and in his own office may often employ many other specialists. Thus he, like the physical plant administrator, is an agent who takes instructions from the client, interprets them, and coordinates the efforts of his technical team in the production of a building.

Rounthwaite makes recommendations for clarifying communication both within the university management hierarchy and with the architect. He urges that use of critical path scheduling techniques be regularly updated and all target dates, critical personnel, and operations be clearly identified. The concepts of resource allocations, growth planning, and functional development of the planning process also receive attention.

SELECTING THE ARCHITECT

Architect selection is included in Johnson's (1968) discussion of the interaction among school officials and professionals in the fields of design and planning. Relevant aspects of architect selection include consideration of professional role, basic factual data, selection methods, and contracts and external parties. Design information relevant to educator-architect relations is discussed in terms of educational specifications, school planning guides, and programs and restrictions. Johnson also defines the architect's role as it is reflected in owner relationships, basic services, fees, special services, and the completed school. An example of a standard architect agreement form supplements the text.

Winning (1968) focuses on the task of selecting a campus architect. He suggests that trustees and administrators obtain reasonable knowledge of the kinds of building design they are interested in and then evaluate prospective architects against six criteria: experience and examples of previous work, flexibility in ideas and operation, engineering competence, judicious use of economical construction methods and materials, functional usage of consultant resources, and ability to function well with contractors.

A detailed study of the educational and experiential backgrounds and current positions of school plant specialists is presented by Drake (1965). The study also gives biographical data on age, sex, entry to specialist field, certification, and membership in professional organizations. Drake concludes his presentation with a review of the literature on the school plant specialists.

Fowler (1972) reports the experiences of one school district that developed its own contract language for filling loopholes in its architect agreements. His report is so arranged that excerpts from the school district's provisions may be compared with corresponding areas in the standardized architectural contract. Basic topics covered are architect's responsibilities, schematic

design, design development, construction documents, construction, owner approval, architect payment, and contracts.

General principles and practices of comprehensive architectural services receive lengthy treatment in a document edited by Hunt (1965). This basic primer was compiled for use by architects wishing to expand the range of services offered to clients. Topics include the role of the architect, principles of comprehensive services, architect-client relations, promotional services, project analysis services, and related supporting services. Discussions range from the organization of an architectural office to professional fees and site analysis.

A brief contract form published by the Ohio State Board of Education (1966) includes descriptions of fees, duties, and specific architect services. The document covers owner responsibilities, construction costs, and payment schedules. Also listed in the contract are accounting records, abandonment provisions, termination of agreement clauses, ownership of documents, insurance, successors, and special provisions.

THE BUILDING PROGRAM

Before an architect can begin drawing the designs for a building, he must know what activities will take place in it. The information that supplies the architect with this understanding is usually gathered together in a *building program.* Davis (1968) points out that the client is often more aware of *what* employees are doing rather than *how* they are doing it. Thus it is usually the case, particularly with complex organizations such as educational institutions, that the client cannot adequately describe all the activities that the building is intended to shelter. Davis argues that "as the complexity of the building grows and we become more and more aware of the extent to which apparently random, unimportant factors can seriously affect human activity, the need for a new kind of professional service, building programming, becomes clear."

After speaking briefly about the need for special consultants to compile the building program, Davis explains how the programmer gathers and analyzes the necessary data. The written program itself should contain information about the number of people to be accommodated, the nature of their activities, and the size and relationships of the spaces that they will need. Most importantly, this information must be presented in a form that is meaningful to the architect. Summing up what the program means to the architect and client, Davis observes,

> The program, of course, is only information for the architect; it suggests limits on his work, but it does not necessarily restrict his freedom. He may decide that aesthetic considerations overrule some of the indicated building functions. The program makes clear just how function is being sacrificed, however, and the owner can decide early in the design process whether or not he wants to allow it. He is paying for two kinds of expertise: architectural and managerial. It is up to him to resolve conflicts. The value of the program here is that it gives him explicit notice as to where conflicts exist.

In a second document, Davis (1969) speaks about the usefulness and tasks of the building program consultant. He describes architectural programming as a three-stage process entailing research, planning, and consultation services.

Research duties outlined in his preceding article (Davis 1968) are explained here in greater detail. These include activity analy-

sis, indepth interviews with the client and prospective inhabitants, prediction of activity-space relationships, quantitative analysis of activities, and tabulation of necessary spaces. Planning tasks relate primarily to composing a statement of objectives and policies for the client and written instructions for the architect.

It is the programmer's responsibility, according to Davis, to clarify and assist in resolving any conflicting objectives that might develop from different levels in the client's hierarchy of management. He advises that

> the process of resolution may reach several levels of management in the client organization, with the programmer sometimes caught in the crossfire, but one of the advantages of programming is that it uncovers conflicts before they are translated into buildings.

Davis also stresses the value of the building programmer continuing as a consultant after the actual program has been approved and the architect has begun his design process. The programmer can provide additional interpretations of the original program information and be in a position to explore conflicts between design and functional goals as they arise in the design process.

Pena and Focke (1969) describe the rationale, principles, and methods of predesign architectural programming in a document directed at those administrators responsible for overall policy-making in facility planning. Basically, the programming process is intended to provide an orderly framework for the architect's definition of a client's total problem. The authors offer a general discussion of data collection, team composition, communications, and various approaches to programming. Also receiving attention are architect-client communications, information processing techniques, and future directions of programming. Diagrams and charts graphically illustrate each major topic.

A brief paper by Green (1967) explores some research problems suggested by applying decision-making theory to architectural programming. Benefits of this approach include selection of the best qualified decision-makers for building committee membership, gathering of accurate information about user needs, and clear definition of client-architect roles. Additional implications may also be drawn concerning the possible effects of sociological research on architectural education in general, and the relationship between information and creativity.

In an earlier document, Brewster (1961) discusses how a building program can effectively communicate educational needs to architects and engineers. In addition to describing his own experiences with written program requirements and architect field studies, he gives a checklist used by architect and university staff in one housing project.

A bibliography by Murtha (1968) presents a selection of technical reports, journal articles, and books on various aspects of systematic school planning and design. Subject areas include the design process in terms of practice, theory, methods, decision systems, and computer applications. Criteria for design are categorized according to design research, research studies, design criteria, human factors, and modular construction. Each section contains a selection of sources related to school and general design applications. Explanations and implications for each topic are also included.

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RESEARCH HIGHLIGHTS

The educator's most important function in the planning process is defining the needs of the educational program. *(Brooks 1972)*

Whenever possible, school boards should consider hiring the principal of a proposed facility in advance and giving him leadership of the educational side of the planning team. *(Brooks 1972)*

The use of special facility planning consultants can minimize the trial-and-error approach to identifying present and future building requirements. *(Agostini 1972)*

The effective administrator of school construction programs must view school planning as directly related to comprehensive community planning. *(Silvernail 1968)*

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